

A photograph of a polar bear family on a snow-covered ice floe. The scene is set against a vibrant sunset sky with shades of orange, red, and yellow. The water in the background is dark and reflects the colors of the sky. The polar bears are silhouetted against the bright light of the sunset. One adult bear is standing on the left, another adult bear is partially visible in the middle, and a cub is sitting on the right.

Integrating climate projections into the management and conservation of polar bears: challenges and opportunities

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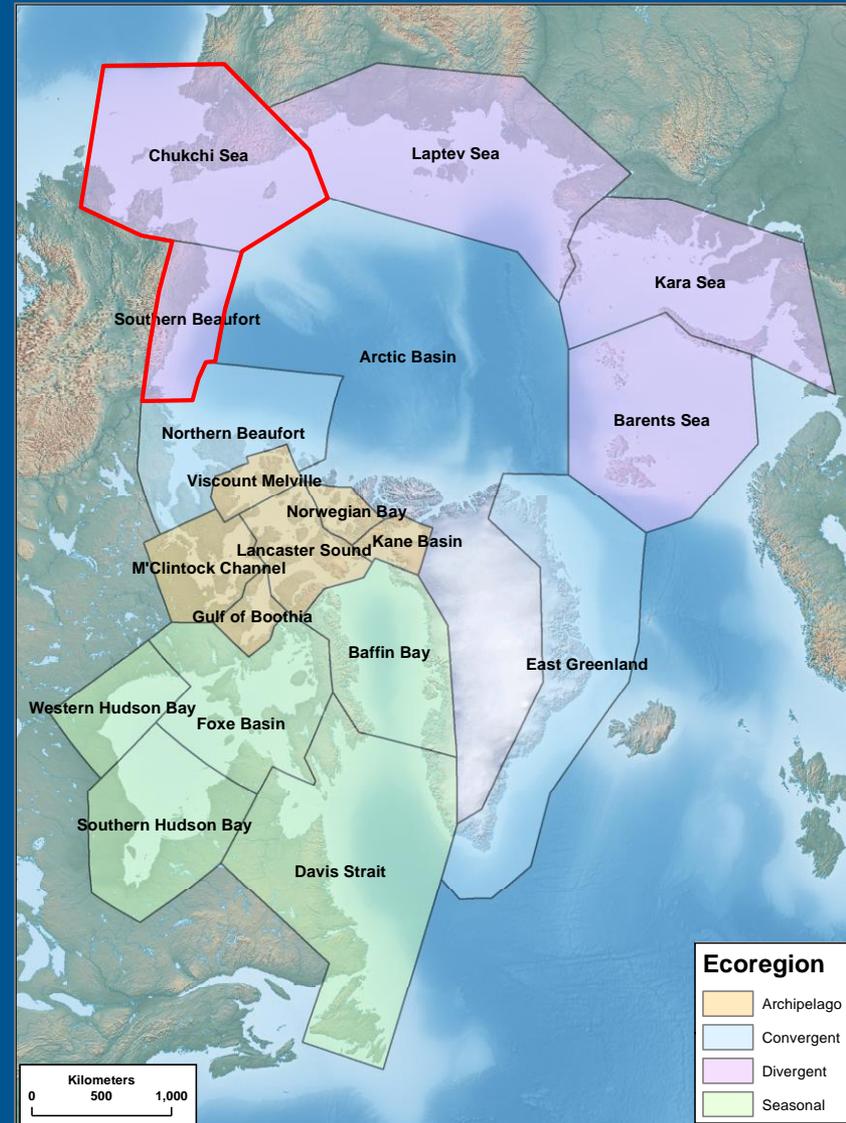
Incorporating climate into SARs for bears...

- Explicit
 - Estimates of abundance and demographics, sea ice dynamics, fasting duration, prey availability, etc.^a
- Implicit
 - Changes in distribution
 - Human-bear interactions and removals
 - Primary: Harvest, and conflict
 - Emphasis on comanagement, monitoring, and mitigation



U.S. Polar Bear Stocks: CBS and SBS

- Divergent Ice Ecoregion
- U.S.: AK Native harvest



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- **CBS**
 - ~3000 bears^a, stable^b
 - Open water and denning
 - Russia
 - MMPA Title V



U.S. Polar Bear Stocks: CBS and SBS

- Divergent Ice Ecoregion
- U.S.: AK Native harvest
- CBS
 - ~3000 bears^a, stable^b
 - Open water and denning
 - Russia
 - MMPA Title V
- SBS
 - ~900 bears^c, recently stable^d
 - Open water and denning
 - Prudhoe Bay, NPR-A, ANWR 1002

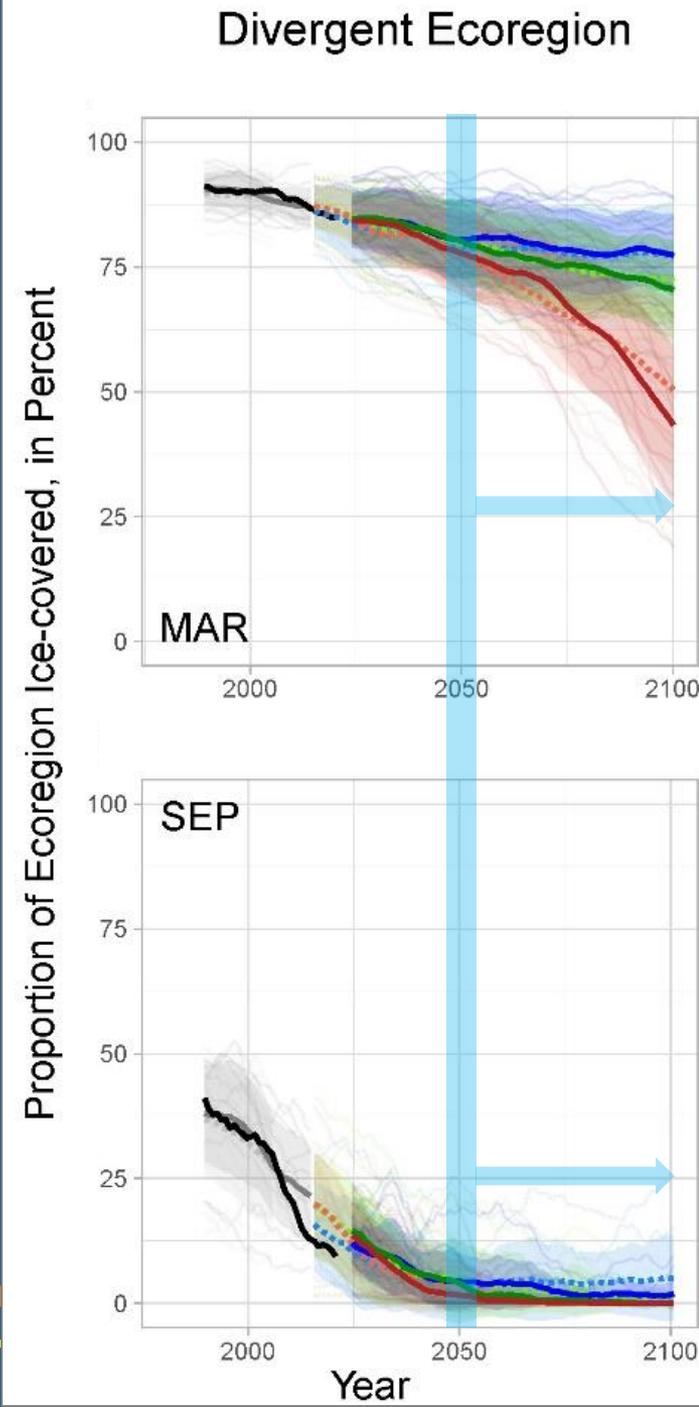


Climate effects to sea ice^a

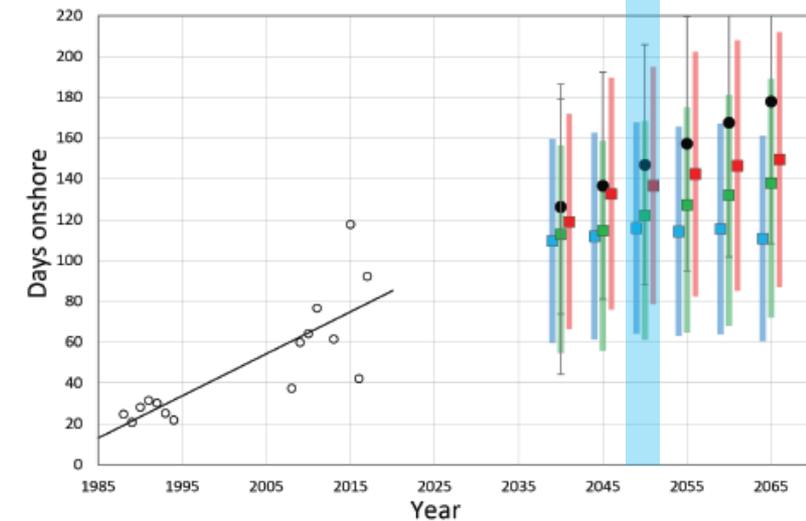
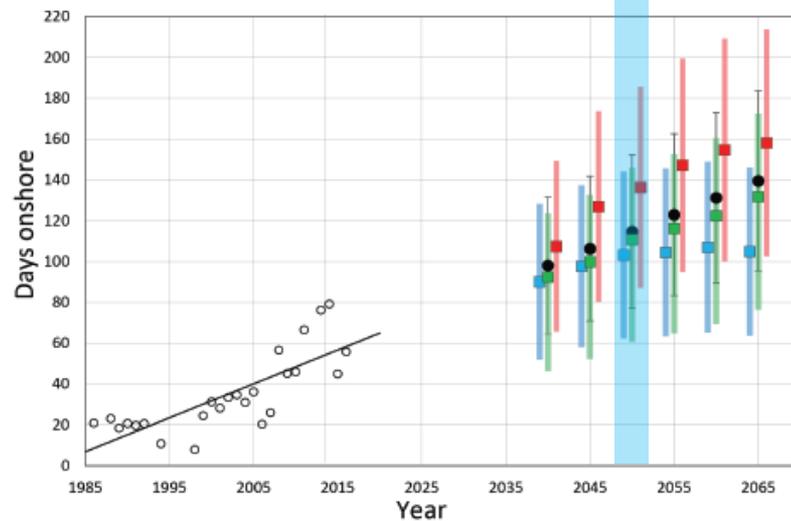
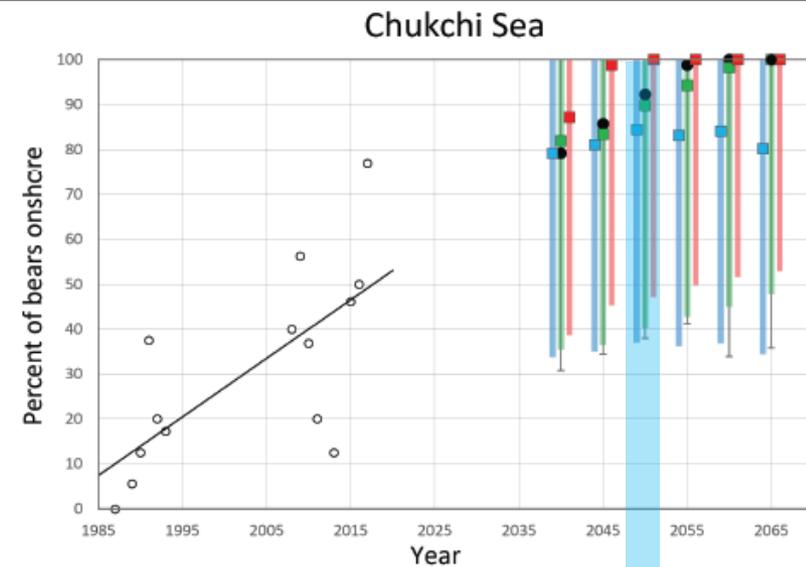
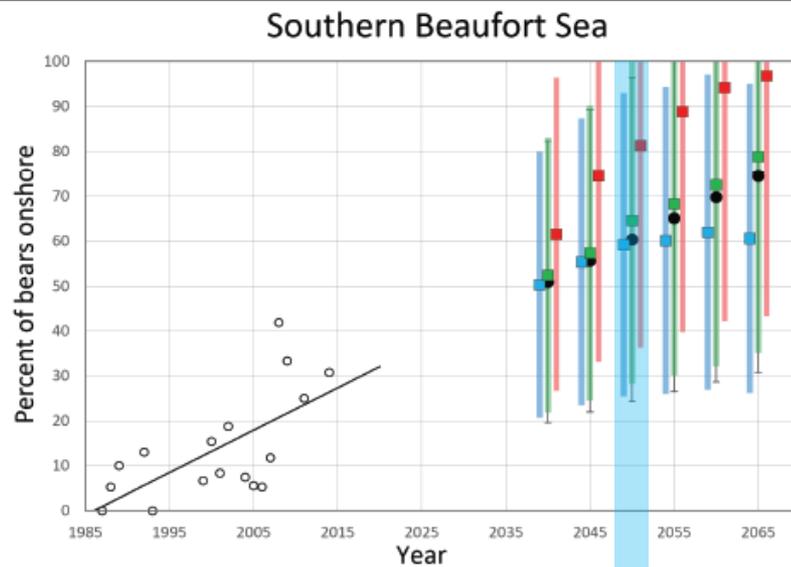
- CMIP 5/6
 - Regardless of emissions scenario, locked into continued loss of sea ice through 2050
 - >2050 emissions scenarios have large effect on projections
 - Currently tracking for RCP85/SSP585 (red)
 - Significant reductions in primary habitat; ice free in autumn



^aDouglas and Atwood 2022



Effects to polar bear distribution^a: larger percentage of the stocks onshore for longer \approx more human-bear interactions



USFWS Management priorities^a

1. Collaboratively manage subsistence harvest
2. Manage human-bear conflicts
3. Protect denning habitat
4. Conduct strategic monitoring and research
5. Minimize risk of contamination from spills
6. Support international conservation efforts through the Range States relationships



^aFive-year review 2023: <https://ecos.fws.gov/ecp/species/4958>

Comanagement: collaboratively managing harvest

- **Develop** and implement sustainable subsistence management and monitoring strategies
 - **ANCC**, North Slope Borough, communities and hunters
 - Formalize comanagement
 - Tribally-administered harvest monitoring, and management programs
 - Subpopulation monitoring



CO-MANAGEMENT AGREEMENT
BETWEEN
THE ALASKA NANNUT CO-MANAGEMENT COUNCIL
AND
THE UNITED STATES FISH AND WILDLIFE SERVICE

THIS CO-MANAGEMENT AGREEMENT ("Agreement") is made by and between the Alaska Nannut Co-Management Council ("ANCC") and the United States Fish and Wildlife Service ("USFWS"), referred to individually as "Party" and collectively as "the Parties."



ANCC
←—————→
ALASKA NANNUT CO-MANAGEMENT COUNCIL

Harvest Management Plan for Chukchi Sea
(Alaska-Chukotka) Polar Bears

Comanagement: collaboratively managing harvest

- Harvest monitoring
 - Community-based monitors (SBS, CBS)
 - Increase reporting^a
 - Basis for HMP (CBS)
- Harvest management
 - CBS = HMP, MMPA Title V
 - U.S. SHL = 42.5 bears/yr^b
 - SBS = I-I Agreement
 - Next abundance estimate \approx 2025
 - Harvest risk assessment = SHL?
 - Robust abundance estimates with IK, and local/regional engagement



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Human-bear interactions: conflict

- Communities
 - Polar Bear Patrol Program
 - North Slope Borough (~100 bear-patrol interactions/yr in SBS)
 - Expansion in CBS region



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- Industry

- 300 sightings (95–705) /yr; 92% in open-water season (Jul–Nov)
 - Attractant management
 - Non-lethal deterrence programs
 - Regulatory processes (e.g., ITAs)
 - Mitigation and monitoring
 - Capture-tag release program, den emergence response, orphaned cub



Climate, bears, people, and SARs: summary

- More bears will be onshore longer and in closer proximity to people for longer in both stocks
- \uparrow human bear interactions \approx \uparrow human safety concerns \approx \uparrow human-caused removals...current trend uncertain, but planning for it
- Harvest and conflict are intertwined in CBS and SBS; no contemporary information from Chukotka
- Formalizing and implementing comanagement will improve harvest monitoring in CBS and SBS and implement harvest management in CBS
- Comanagement will improve estimates of human-caused removals and contributing factors, and help achieve primary conservation goal
- Abundance estimates that incorporate IK, and have regional/local support are required for comanagement and will inform SHL (climate-induced changes in K)
- Durable funding sources needed for comanagement, conflict management, and subpopulation monitoring

The Fish and Wildlife Service's mission is to *work with others to conserve, protect, and enhance fish, wildlife, plants, and their habitat for the continuing benefit of the American people.*

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